Case report

Recurrent embolism caused by floating thrombus originating from the ligamentum arteriosum

Yasutaka Hirata*, Minoru Ono, Tetsuro Morota, Shinichi Takamota

Department of Cardiothoracic Surgery, University of Tokyo, 7-3-1 Hongo Bunkyo-ku, Tokyo 113-8655, Japan

Received 8 January 2003; received in revised form 27 April 2003; accepted 11 May 2003

Abstract

Few patients with an embolism derived from apparently normal thoracic aorta with no other disease have been reported. We were presented with a case of a floating thrombus originating from the ligamentum arteriosum that caused multiple embolic episodes in the bilateral common iliac and superior mesenteric arteries. From our findings, we recommend a surgical approach for a floating thrombus in the aorta to prevent further embolism.

© 2003 Elsevier B.V. All rights reserved.

Keywords: Aortic thrombus; Transesophageal echocardiogram; Ligamentum arteriosum

1. Introduction

Emboli originating from apparently normal thoracic aorta with no signs of atherosclerosis are very rare and diagnosis of such lesions has not always been easy to establish. A transesophageal echocardiogram (TEE) is the best modality to analyze this frequently neglected cause of peripheral emboli. We recently identified multiple thrombi in the descending aorta of a patient, one of which originated from the site of connection of the ligamentum arteriosum. These thrombi were responsible for repeated peripheral emboli.

2. Case report

A 43-year-old woman was admitted with an acute onset of pain, coldness, and paresthesia in the bilateral legs. Popliteal, posterior tibial, and dorsalis pedis pulses were not palpable. She had been otherwise healthy except for myoma uteri. An angiogram showed total occlusion of the bifurcation of the terminal aorta. We performed an embolectomy immediately. A longitudinal aortotomy was performed in the terminal aorta and a saddle shaped white thrombus was removed, and it successfully restored perfusion to the limbs with normal pulses. A histopathological examination revealed a thrombus without a cellular component and the following diagnostic work-up for the source of embolism, which included a TEE, was negative for a thrombus or tumor in the heart, however, the descending aorta was not examined at that time. An extensive serologic survey for hypercoagulable state or vasculitis was also negative. On the 12th postoperative day, the patient experienced sudden abdominal pain. A computed tomographic scan showed an embolism of the superior mesenteric artery and a surgical embolectomy was performed immediately. The small intestine was found to be slightly ischemic, however, there was no obvious necrosis. The superior mesenteric artery was not palpable and the thrombus was successfully removed. An intraoperative TEE revealed a floating pedunculated mass with inhomogeneous echogenicity at the isthmus of the descending aorta (Fig. 1), and another small mass in the middle descending aorta.

Multiple embolic events prompted another urgent operation. The aorta was approached via a left thoracotomy and the descending aorta was thoroughly examined by direct ultrasonic scanning using a finger-tip probe. The main mass was stemmed from the opposite side of the left subclavian artery, with another small mass identified in the middle of the descending aorta. We established a femoro-femoral bypass from the left femoral artery and vein, and before establishing the bypass, the transverse arch and left...
The distal arch was incised, and a mass 5 cm in length was found firmly attached to the insertion point of the ligamentum arteriosum. The tumor was removed along with the aortic wall, with a safety margin of 5 mm proximally (Fig. 2), because malignancy could not be ruled out from the TEE findings. The intima of the aorta appeared normal, except for the insertion of the mass. A Hemashield (Meadox Medicals, Oakland, NJ) tube graft was inserted to graft the descending aorta.

A postoperative TEE revealed complete removal of the mass and the patient recovered well without any embolic symptoms. A histopathologic examination revealed a slightly thickened intima of the aorta with a superimposed thrombus.

3. Discussion

Emboli originating from apparently normal thoracic aorta with no signs of atherosclerosis are very rare and diagnosis of these lesions is difficult to establish. TEE findings allow for an easier analysis of this frequently neglected cause of peripheral emboli.

Although the heart was investigated by TEE at the first episode in the present case, the descending aorta was not examined and we consider that such observation of the descending aorta should be included as part of the work-up of a patient who presents peripheral emboli. During the examination, particular attention should also be given to the proximal descending aorta in order to visualize the insertion site of the ligamentum arteriosum. In the present patient, the thrombus was stemmed at this site and the aortic wall was slightly thickened, thus, it remains a possibility that a local endothelial abnormality or residual ductal tissue at this site was the initial cause of these thrombus formations. However, the ligamentum arteriosum as a source for thrombus formation is a rare entity, with only four cases reported previously in literature [1–3].

Aggressive treatment was considered because of the risk of massive systemic embolization. Although no standard approach has been elucidated for this kind of unusual case, thrombolysis has been suggested as a promising therapeutic regimen [4]. Others reported an asymptomatic patient, for whom heparinization led to complete resolution [5]. In the present patient, aggressive surgical treatment was performed because two life threatening embolic episodes occurred within a short period.

The surface of the mass was found to have high echogenicity, resembling that of a primary intimal sarcoma of the aorta [6], which led us to consider the possibility of a malignant tumor. Therefore, the mass was removed along with the aortic wall and a safety margin. An intraoperative histopathological examination might have been another choice, however, that procedure prolongs pump time and may rather be detrimental. Further studies are needed to determine an optimal treatment strategy.

References


